

What is claimed is:

1. A portable vacuum cleaner comprising:

an upright frame;

an upright hopper having an open top carried within the frame;

a closure cover for the open top of said hopper;

mechanical apparatus evacuating air from the hopper creating a partial vacuum in said hopper carried adjacent to the cover for collecting material within the hopper;

a discharge chute carried adjacent a lower end of said hopper;

a gate normally closing said discharge chute for retaining material collected in the hopper; and

linkage carried adjacent to and externally of the hopper opening said gate discharging said material from the hopper.

2. A portable vacuum cleaner set forth in claim 1 including a hose carried collection apparatus communicating with said hopper.

3. A portable vacuum cleaner set forth in claim 1 including wheels carried by said frame for transporting said vacuum cleaner.

4. A portable vacuum cleaner set forth in claim 1 including at least one receptacle carried by said frame for receiving a lift truck operator.
5. A portable vacuum cleaner set forth in claim 1 wherein said linkage includes a manually actuated operator for moving said gate to open and closed positions.
6. A portable vacuum cleaner set forth in claim 1 wherein said linkage includes a toggle linkage.
7. A portable vacuum cleaner set forth in claim 1 wherein said upright hopper has a fixed mounting in said frame and said linkage is carried by said hopper.
8. A method of vacuum cleaning comprising the steps of:
  - providing an upright frame;
  - mounting an upright hopper having an open top within the frame;
  - positioning a closure cover over the open top of the hopper;
  - evacuating air from the hopper creating a partial vacuum in said hopper for collecting material within the hopper;
  - providing a discharge chute adjacent a lower end of the hopper;
  - closing a gate carried by the discharge chute for retaining material collected in the hopper; and
  - opening the gate discharging the material from the hopper.

9. A method of vacuum cleaning set forth in claim 8 including the step of actuating linkage carried adjacent to and externally of the hopper opening the gate.
10. A method of vacuum cleaning set forth in claim 8 including the step of attaching wheels to the frame for transporting the frame and hopper.
11. A method of vacuum cleaning set forth in claim 8 including the step providing at least one receptacle carried by the frame for receiving a lift truck operator.
12. A method of vacuum cleaning set forth in claim 9 including the step of pivoting said gate to open and closed positions by manually actuating an operator for positioning the linkage and the gate operated thereby.
13. A method of vacuum cleaning set forth in claim 8 including the step of positioning mechanical apparatus evacuating air on the cover.
14. A method of vacuum cleaning set forth in claim 11 including the step of raising the frame and the hopper carried thereby by action of the lift truck operator positioning the hopper for discharging material collected in the hopper.
15. A portable vacuum cleaner comprising:  
an upright frame;

an upright hopper carried within the frame;

a closure at a top of said hopper creating a partial vacuum in said hopper for collecting material within the hopper;

normally closed discharge apparatus carried adjacent a lower end of said hopper for retaining material collected in the hopper including an operator positioned adjacent to and externally of the hopper for discharging said material from the hopper.

16. A portable vacuum cleaner set forth in claim 15 including a hose carried collection apparatus communicating with said hopper.

17. A portable vacuum cleaner set forth in claim 15 including wheels carried by said frame for transporting said vacuum cleaner.

18. A portable vacuum cleaner set forth in claim 15 including at least one receptacle carried by said frame for receiving a lift truck operator.

19. A portable vacuum cleaner set forth in claim 15 wherein said operator includes a toggle linkage.

20. A portable vacuum cleaner set forth in claim 15 wherein said upright hopper has a fixed mounting in said frame and said normally closed discharge apparatus is carried by said hopper.

21. A portable vacuum cleaner set forth in claim 15 wherein said normally closed discharge apparatus includes a discharge chute and a normally closed gate for discharging material from said hopper.

22. A discharge chute for a vacuum cleaner comprising:

an upright hopper having an open lower end and a centrifugal blower at a top thereof collecting material through vacuum hoses into the hopper;

a downwardly inclined surface extending at least partially across the open lower end of the hopper forming a downwardly extending passageway of diminishing cross section;

an outlet opening in the passageway; and

a pivoted gate in normally closed position containing material collected in the hopper.

23. The discharge chute set forth in claim 22 including linkage external to the hopper and the chute forcefully biasing the gate toward closed position.

24. The discharge chute set forth in claim 23 wherein the linkage includes a toggle joint exerting the forceful biasing of the gate.

25. The discharge chute set forth in claim 24 wherein the gate is carried by manually rotatable operator having connection to the gate through the toggle joint.

26. The discharge chute set forth in claim 25 including a gasket carried between the gate and the chute for facilitating retention of liquid and solid material in the hopper.

27. The discharge chute set forth in claim 25 wherein the rotatable operator extends at right angles to the linkage in

alignment with the gate across a front of the hopper.

28. The discharge chute set forth in claim 27 including a pivotal mounting for the gate extending in parallel spaced relation to the rotatable operator.

29. The method of discharging material collected through vacuum hoses into an upright hopper comprising the steps of:

positioning a downward extending discharge chute at an open bottom of the hopper narrowing to form a discharge opening;

utilizing a normally closed pivoted gate for retaining the material collected in the hopper; and

actuating linkage for moving the gate to open position discharging the material collected in the hopper.

30. The method set forth in claim 29 including the step of exerting a force maintaining the gate in closed position through the action of a toggle apparatus.

31. The method set forth in claim 30 including the step of actuating a link connected to pivot and to the gate for opening and closing the gate.

32. The method set forth in claim 31 including the step of manually actuating a toggle apparatus for fixing linkage for pivotally moving the gate.

33. The method set forth in claim 29 including the step of pivoting a rod rotatably carried at a front of the hopper above

the chute for opening and closing the gate.

34. The method set forth in claim 30 including the step of providing a deformable gasket sealing the gate in respect to the chute against leakage of solid and liquid waste.

35. The method set forth in claim 30 including the step of manually actuating a lever for rotating the rod for actuating linkage opening and closing the gate.

36. A portable industrial vacuum cleaner comprising:  
an exterior frame including a base;  
a hopper fixedly mounted on the frame;  
a fan mounted at a top of the hopper inducing a partial vacuum therein; and

transversely spaced receptacles carried within the base for receiving the forks of a fork lift truck transporting the vacuum cleaner.

37. The portable industrial vacuum cleaner set forth in claim 36 including:

spaced wheels transporting the vacuum cleaner independently of the spaced receptacles.

38. The portable industrial vacuum cleaner set forth in claim 37 including a downwardly extending chute at a bottom of the hopper for discharging waste collected in the hopper.

39. The portable industrial vacuum chute set forth in claim 38

a pivoted gate and manually actuated linkage for opening the gate for discharging waste material.

40. A method of transporting an industrial vacuum cleaner having a hopper mounted within a vertical frame comprising the steps of:

inducing a partial vacuum within the hopper for collecting waste material therein;

positioning spaced receptacles for receiving the forks of a fork lift truck extending in alignment with respective sides of said frame;

providing a discharge apparatus for removal of waste material collected in the hopper at a lower end of the hopper; and

as an alternative to transporting the vacuum cleaner on the wheels and to facilitating discharge of the waste material elevating the vacuum cleaner.

41. The method set forth in claim 40 including the steps of:

positioning wheels on the frame adjacent to marginal portions of the frame externally of the receptacles carrying the vacuum the vacuum cleaner for transport;

as an alternative to transporting the vacuum cleaner on the wheels and to facilitate discharge of the waste material elevating the vacuum cleaner.

42. The method set forth in claim 41 including the step of



mounting casters on the frame above the receptacles supporting the frame including the receptacles for transport on the casters.

43. The method set forth in claim 41 including the step of providing a chute for discharging the waste material from the hopper; and

manipulating a pivoted gate for opening and closing the chute.